

Amendments to the Specification

The paragraph starting at page 2, line 10 and ending at line 20 has been amended as follows.

As the printhead structure, various printheads in which a plurality of printing elements are aligned in one or a plurality of lines have conventionally been known. In a printhead of this type, N printing elements are designed as one block, and several or several ~~ten~~ tens of driving integrated circuits which can be simultaneously driven are mounted on a single board. Image data are aligned in correspondence with printing elements, and arbitrary printing is done on a printing medium such as a paper sheet by driving the recording elements.

The paragraph starting at page 14, line 22 and ending at page 15, line 2 has been amended as follows.

"Ink" (to be also referred to as "liquid") should be interpreted as ~~widely~~ broadly as the definition of "printing (print)". "Ink" represents a liquid which is applied to a printing medium to form an image, design, pattern, or the like, process the printing medium, or contribute to ink processing (e.g., solidification or insolubilization of a coloring material in ink applied to a printing medium).

The paragraph starting at page 15, line 21 and ending at page 16, line 3 has been amended as follows.

The printhead IJH includes printheads for monochrome printing and color printing, and either printhead can be properly selected and mounted on the carriage HC by the user in accordance with the purpose. In the use of the printhead for monochrome printing, an ink tank IT which stores monochrome ink (black ink) is mounted. In the use of the printhead for color printing, four ink tanks IT which respectively store four inks, namely, yellow, magenta, cyan, and black inks, as shown in Fig. 1, are mounted.

The paragraph starting at page 17, line 15 and ending at line 25 has been amended as follows.

In Fig. 2, reference numeral 1700 denotes an interface which inputs a printing signal; 1701, an MPU; 1702, a ROM which stores a control program executed by the MPU 1701; 1703, a DRAM (to be referred to as a DRAM RAM hereinafter) which stores various data (printing signal, printing data supplied to the head, and the like); and 1704, a gate array (G.A.) which controls supply of printing data to a printhead IJH, and also controls data transfer between the interface 1700, the MPU 1701, and the RAM 1703. A control circuit 101 has this arrangement.

The paragraph starting at page 18, line 18 and ending at line 21 has been amended as follows.

Fig. 3 is a block diagram showing a basic arrangement for acquiring feature information stored in the memory 131 of a printhead IJH according to the first embodiment of the present invention[[]].

The paragraph starting at page 21, line 16 and ending at line 24 has been amended as follows.

Accordingly, an address corresponding to information (information identification name) designated by the control instruction 111 is obtained by looking up the table, and a proper access signal 122 is generated as a control signal. In this example, read of driving control information is designated, and an access signal is so generated as to read information stored at addresses 0xSSSS to 0xTTTT. Driving control information is ~~reads~~ read out from the memory 131.

The paragraph starting at page 22, line 27 and ending at page 23, line 8 has been amended as follows.

In the above example, the carriage control unit 102 sends back the read printhead driving control information to the control ~~circuit~~ circuit 101. The driving control information may be utilized for feedback control in the carriage control unit 102. When the control system must control driving in real time, control is completed by only the carriage control unit 102, thereby quickly controlling the printhead. This example will be described in the second embodiment.

The paragraph starting at page 41, line 11 and ending at line 16 has been amended as follows.

Control according to the present invention can be applied regardless of the electrical/mechanical arrangement, software sequence, and the like as far long as the present invention provides an arrangement which links the printing apparatus, carriage control unit, and print head by command communication.

The paragraph starting at page 42, line 9 and ending at page 43, line 3 has been amended as follows.

As the typical arrangement and principle, it is preferable to use the basic principle disclosed in, e.g., U.S. Patent Nos. 4,723,129 and 4,740,796. This system is applicable to both a so-called on-demand apparatus and continuous apparatus. The system is particularly effective in an on-demand apparatus because at least one driving signal which corresponds to printing information and gives a rapid temperature rise exceeding nuclear nucleate boiling is applied to an electrothermal transducer which is arranged in correspondence with a sheet or channel holding a liquid (ink), heat energy is generated by the electrothermal transducer to effect film boiling on the heat acting surface of the printhead, and consequently a bubble can be formed in the liquid (ink) in one-to-one correspondence with the driving signal. The liquid (ink) is discharged from an orifice by growth and shrinkage of this bubble, forming at least one droplet. This driving signal is more preferably a pulse signal because growth and shrinkage of a bubble are instantaneously appropriately performed to discharge the liquid (ink) with a good response characteristic.